What is claimed is:

1   1. A method of adding a watermark to a sequence of executable instructions comprising the
2   steps of:
3   receiving the sequence of executable instructions and a key; and
4   modifying the sequence of executable instructions in a manner determined by the key,
5   the sequence being modified such that the usefulness of the sequence for the sequence's
6   intended purpose is not affected thereby.

1   2. The method set forth in claim 1 wherein:
2   the step of receiving the sequence of executable instructions further includes receiving
3   a watermark value; and
4   the step of modifying the sequence modifies the sequence so that certain of the
5   instructions therein represent a watermark value.

1   3. The method set forth in claim 2 wherein the step of modifying the sequence includes the
2   steps of:
3   using the key to determine locations in the key including modification locations at
4   which the sequence is to be modified; and
5   modifying the sequence at the modification locations such that the locations specified
6   by the key represent the watermark value.

1   4. The method set forth in claim 3 wherein the step of modifying the sequence includes the
2   step of:
3   inserting one or more executable instructions at each of the modification locations, the
4   inserted instructions having no effect on any output from the execution of the sequence of
5   instructions.

1   5. The method set forth in claim 4 wherein:
2   the instructions at the locations specified by the key represent values of digits of the
3   watermark value.

1   6. The method set forth in claim 2 further comprising the step of:

2 providing the watermark value to an authenticating entity that authenticates the

3 watermarked code.

1 7. The method set forth in claim 2 further comprising the step of:

2 providing the key to the authenticating entity.

1 8. The method set forth in claim 1 wherein:

2 the sequence of executable instructions is modified such that when the sequence of

3 executable instructions is executed, execution state is produced which has a property that

4 depends on the key.

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1 9. The method set forth in claim 8 wherein:

2 the execution state is a stack depth graph.

1 10. The method set forth in claim 9 wherein:

2 the execution state is output from the execution.

1 11. The method set forth in claim 10 wherein:

2 the property is an order of elements in the output.

1 12. The method set forth in claim 10 wherein:

2 the property is an additional element in the output.

1 13. The method set forth in claim 10 wherein:

2 the property is a class of an element in the output.

1 14. The method set forth in claim 10 wherein:

2 the property is a constraint that is satisfied by elements of the output.

1 15. The method set forth in claim 8 further comprising the step of:

2 providing a description of the produced execution state to an authenticating entity that

3 authenticates the watermarked code.

1   **16.** The method set forth in claim 15 further comprising the step of:

2   providing the key to the authenticating entity.

1   **17.** The method set forth in claim 1 further comprising the step of

2   providing the key to an authenticating entity.

1   **17.** A method of authenticating a watermarked sequence of executable instructions, the

2   watermark having been produced by modifying the sequence according to a key such that

3   certain of the instructions in the sequence represent a watermark value,

4   the method comprising the steps of:

5   receiving the watermarked sequence or a copy thereof;

6   using the key to locate the certain instructions in the received sequence and read the

7   watermark value; and

8   using the watermark value to determine whether the received sequence is authentic.

1   **18.** The method of authenticating set forth in claim 17, the method further comprising the step

2   of:

3   receiving another watermark value; and

4   in the step of using the watermark value to determine whether the received sequence is

5   authentic, the watermark value is compared to the other watermark value.

1   **19.** The method of authenticating set forth in claim 18, the method further comprising the step

2   of:

3   receiving the key.

1   **20.** A method of authenticating a watermarked sequence of executable instructions, the

2   watermark having been produced by modifying the sequence according to a key such that

3   when the sequence is executed, execution state is produced,

4   the method comprising the steps of:

5   receiving a description of the execution state; and

6   authenticating the watermarked sequence by confirming that the received description

7   describes execution state produced by an execution of the sequence.

1   **21.** The method set forth in claim 20 further comprising the step of:

2   receiving another description of the execution state, the other description describing

3   execution state produced by the execution of the sequence; and

4   in the step of authenticating, comparing the description and the other description.

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1   **22.** The method set forth in claim 21 wherein:

2   the other description is a stack depth graph.

1   **23.** The method set forth in claim 20 wherein the execution state is output from the execution,

2   the output having a property which can be determined using the key and

3   the method further comprises the steps of:

4   receiving the output from the execution; and

5   the step of authenticating includes the steps of

6   receiving the execution state;

7   employing the key to determine the property; and

8   comparing the determined property with the received description.

1   **24.** The method set forth in claim 23 wherein:

2   the determined property is an order of elements in the output.

1   **25.** The method set forth in claim 23 wherein:

2   the determined property is an additional element in the output.   .

1   **26.** The method set forth in claim 23 wherein:

2   the determined property is a class of an element in the output.

1   **27.** The method set forth in claim 23 wherein:

2   the determined property is a constraint that is satisfied by elements of the output.